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ROCKY MOUNTAIN PIPELINE PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TECHNICAL REPORT FOR WATER RESOURCES

ROCKY MOUNTAIN PIPELINE COMPANY

JULY 1981

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WATER RESOURCES

TECHNICAL REPORT

Rocky Mountain Pipeline Project

Environmental Impact Statement

July 1981

Department of the Interior

Bureau of Land Management

Office of Special Projects

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Acknowledgements

This technical report was prepared in support of the Rocky Mountain Pipeline Project draft EIS.

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DESCRIPTION OF THE STUDY AREA

The Water Resources Technical Report describes the water resources that occur on or near the Rocky Mountain Pipeline Project (RMPP). The information presented here supplements and supports the RMPP environmental impact statement (EIS) which is limited in accordance with the new Council on Environmental Quality (CEQ) guidelines.

A complete project description is presented in chapter 2 of the RMPP EIS. The following is a brief summary of the Proposed Action, six alternatives, and five variations to the project. Variation 1, Strawberry Reservoir Variation was deleted midway through the analysis.

Proposed Route

The RMPP is a 610-mile long natural gas pipeline transmission system proposed in a joint venture by Pacific Gas Transmission Company, (a subsidiary of Pacific Gas and Electric Company (PG&E), El Paso Natural Gas Company, Pacific Interstate Transmission Company, and Northwest Pipeline Company. They propose to construct a 583-mile long, 36-inch diameter interstate pipeline from Lincoln County, Wyoming, to the Nevada/California border in Clark County, Nevada. This pipeline would connect with a new 27-mile long, 36-inch diameter intrastate pipeline proposed by PG&E and Pacific Lighting Service Company. The project, as proposed, would provided potential customers in California and other southwestern states with natural gas supplies from the Overthrust Belt and Hingeline gas resource areas of the central Rocky Mountain region. (See map 1 for the location of the Proposed Action, alternatives, and variations).

MAP 1 ROCKY MOUNTAIN PIPELINE PROJECT
PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

In addition to the pipeline, other components of the Proposed Action would include a compressor station, 2 meter stations, 5 maintenance bases, approximately 34 block valves and 15 cathodic protection stations and a communication system.

Alternatives

Alternative A, the Northern Systems Alternative, would use portions of existing pipeline systems to transport the gas a total of 1,604 miles from Wyoming, through Idaho and Oregon to markets in California. This alternative would require construction of a minimum of 76.8 miles of new pipeline which would be looped (tied) along the existing Northwest pipeline in Idaho total of 255 miles of new pipeline. This alternative is contingent on the prebuilding (construction ahead of planned schedule of a 380-mile long segment of the Western Leg of the Alaska Natural Gas Transportation System south from Stanfield, Oregon. A new compress station would be built at Stanfield, Oregon as part of this alternative.

Alternative B, the Sanpete Valley Alternative, would transport natural gas approximately 630 miles from Wyoming of California. The pipeline route required by this alternative would be the same as that of the Proposed Action except beween Proposed Action milepost 175 and 257 in Utah. Here, the alternative route would pass through Sanpete Valley to the east instead of through Juab Valley.

Alternative C, the Central Nevada Alternative, would transport natural gas approximately 862 miles from Wyoming to San Bernardino County, California. The pipeline route require by this alternative would be the same as the Proposed Action up to Proposed Action milepost 195, south of Nephi, Utah. From the point, the alternative route generally follows existing highway corridors and proceeds through Utah, central Nevada through Ely and Tonopah, and south through the Owens Valley in California. This alternative would require the same types of facilities as the Proposed Action. Construction techniques would be the same, except that construction camps would be required.

Alternative D, the Sevier-Escalante Desert Alternative, would transport natural gas approximately 622 miles from Wyoming to California. The pipeline route required by this alternative would follow the same route as the Proposed Action up to Proposed Action milepost 195 south of Nephi, Utah. From the point, it would follow existing or proposed utility corridors along the Sevier River to the west of the Proposed Action. This alternative would rejoin the Proposed Action at milepost 366 north of Newcastle, Utah. The facilities would be simlar to those for the Proposed Action.

Alternative E, the West Salt Lake Alternative, would transport natural gas approximately 747 miles from Wyoming to California. The pipeline route required by this alternative would follow the existing Northwest pipeline in Wyoming to Alternative A milepost 48 in Idaho. It would then depart from this right-of-way, crossing the salt flats west of the Great Salt Lake, and connect with the Proposed Action route at milepost 363 near Fillmore, Utah. Construction through the salt flats would require different construction techniques than those for the Proposed Action, such as construction of a raised road for vehicle use. It would require two compressor stations. The pipeline would have to be protected from the corrosive action of the salts. The other facilities required would be similar to those for the Proposed Action.

Alternative F, the Provo Canyon Alternative, would transport natural gas approximately 619 miles from Wyoming to California. The pipeline route required by this alternative would follow the same route as the Proposed Action except from milepost 180 to 214 in Utah. Here, it would pass through Provo Canyon to the west. The facilities required would be similar to those for the Proposed Action.

Variations

The six variations studied are short pipeline segments that would replace portions of the Proposed Action. Variation 1, Strawberry Reservoir, would pass east of the reservoir and the Proposed Action. Variation 2, Thistle Creek would traverse Spanish Fork Canyon to the east of the Proposed Action. Variation 3, East Las Vegas would pass to the west of the Frenchman Mountains and the Proposed Action. Variation 4, Fort Mojave would pass west of the Fort Mojave Indian Reservation. Variation 5, Mill Creek would pass east of the Proposed Action. Variation 6, Daniels Canyon would pass through Daniels Canyons near Heber City, Utah.

WATER RESOURCES

The information contained in this technical report presents data on the nature and occurrence of surface water, ground water, and floodplains around and within the project area. Surface water primarily occurs in streams throughout the project area. At any given time, many of these will be dry, therefore they are classified as intermittent. The perennial streams are those that maintain flow throughout the year. The construction impact of sediment movement is discussed for both those types of streams. The nature and extent of floodplains and ground water will also discussed, as is the acquisition, use, and discharge of hydrostatic test water.

METHODOLOGY

Surface Water

The Rocky Mountain Pipeline Project (RMPP) would potentially cross many intermittent and perennial streams. The purpose of this section of the Water Resources Technical Report is to present data on representative crossings and to estimate the impacts associated with crossing these streams.

Stream crossings were identified from the National Topographic Maps 1:250,000 scale series. All named stream crossings for the Proposed Action, alternatives, and variations are listed by milepost in a downstream order. From these maps, the streams were classified as intermittent or perennial. In addition to the flow classification, the streams were also classified by the U. S. Fish and Wildlife Services' Stream Classification System, which is based upon the fisheries' potential of the stream. Information on the flow and the sediment movement at the stream crossings is the only aspect that will be quantitatively treated in this report.

Appendix A lists the stream crossings by milepost, flow class (intermittent or perennial), and location for the Proposed Action, alternatives, and variations. Mileposts can be located by referring to the Graphic Supplement.

The major concern with a pipeline stream crossing is the disruption of the stream bed and the increase in sediment movement. The sediment that is dislodged during construction finds three avenues for transport; the bedload, the dissolved load, and the suspended load. Both the bedload and the dissolved load would be changed little, if any, by trenching through the streambed; however, the suspended load would become a primary transporter. The distance that the construction-induced sediment would be transported depends upon 1) construction techniques, 2) the stream flow parameters (water depth and velocity), and 3) the grain size distribution of the stream bed materials.

Construction Technique

The construction technique which would be used at a stream crossing is dependent upon the type of stream to be crossed. Braided or wide shallow streams would be crossed by diverting one-half of the stream flow while the other half is crossed. Solid flow or one-channel streams would be crossed by wet construction. Weirs and sand bags would be installed diverting the water to a central location, then earthen ramps would be built for a construction pad. When the ditch is completed the concrete coated pipe would be pulled into place.

Stream crossings would be constructed in a manner to minimize the time the bed and banks would be disturbed. The right-of-way would be prepared on both sides of the stream crossing prior to construction of the crossing and flow would be maintained during stream crossings.

Specialized construction equipment units would be used at stream crossings. These units are combination excavating and material handlers that would serve as a backhoe, dragline, clamshell, or crane. The pipe would be buried a minimum of 5 feet below the stream bed and the trench refilled with the excavated materials. The type of construction technique that would be used at the stream crossings will determine what type of permit is required from the U.S. Army Corps of Engineers (COE). If fill materials are needed to form a construction pad then a specific permit will be required, if not a nationwide permit will cover all crossings.

Stream Flow Parameters

Stream flow parameters of average flow depth and average velocity were determined by studying U.S. Geological Survey (USGS) Water Resources Data for the various states (1978, 1977, and 1976). Additional data was obtained from USGS District Offices and from the Department of Water and Power, City of Los Angeles. Flow data was determined for stream crossings that met three criteria: 1) the stream needed to be typical or representative of an area,

2) the gauging station needed to be within 10 river miles of the stream crossing, and 3) the gauge needed to have long term good records. Average flow depth and average velocity were determined by acquiring unpublished rating curve data from the various offices. These data are displayed in table 1.

No stream crossing data that met the previously mentioned criteria were available for the variations nor for Alternatives A, B, E, and F, therefore, crossings in these areas were not listed in table 1. However, these areas are similar to the areas where data exists; therefore, like conditions are expected at these stream crossings.

Grain Size Distribution

The grain size distribution of the streambed materials was estimated using Soil Conservation Service Soil Survey Reports. On the maps in these publications, the stream crossings with flow data were located and the soils that lay in the stream valley were identified. Based upon the dominant texture of the soil profile and the text description, the various amounts of coarse fragments, sand, silt, and clay were determined. Table 2 summarizes the grain size distribution data. (Table 2 does not list information for the variations nor for Alternatives A, B, E, or F for the reasons discussed in the previous paragraph.) From these data a grain size distribution curve was derived for representative stream crossings.

TABLE 1

AVERAGE FLOW DEPTH AND AVERAGE VELOCITY

Stream	Average Flow Depth (ft)	Average Velocity (ft/sec)
Proposed Action		
Woodruff Creek	0.8	2.3
Provo River	1.3	3.0
Weber River	0.9	1.3
Chalk Creek	1.2	1.6
Salt Creek	0.8	2.4
Muddy River	1.5	1.7
Las Vegas Wash	1.0	1.3
Alternative C - Central Nevada Alternative		
Sevier River	2.0	1.3
Steptoe Creek	0.9	1.5
Alternative D - Sevier-Escalante Desert Alternative		
Sevier River	2.0	1.3
Beaver River	1.1	1.1

Correspondence about unpublished gauge data with: R.W. Cruff, USGS Salt Lake City Utah; Howard R. Frisbie USGS Carson City Nevada; and James F. Wickser, Department of Water and Power the City of Los Angeles, California.

TABLE 2

GRAIN SIZE DISTRIBUTION DATA

Stream	Texture	Course Fragments(%)	Sand(%)	Silt(%)	Clay	Grain sizes Fragments(mm)	Sand(mm)	Silt(mm)	Clay(mm)
Proposed Action									
Woodruff Creek	clayey skeletal	35	26	19.5	19.	76	0.25	0.02	0.002
Provo River	(coarse) sandy loam	0	70	20	10	0	0.42	0.02	0.002
Weber River									
Chalk Creek									
Salt Creek	silt loam	0	30	60	10	0	0.25	0.02	0.002
Muddy River	(coarse) sandy clay loam	0	60	10	30	0	0.42	0.02	0.002
Las Vegas Wash	(very fine) sandy loam	0	70	20	10	0	.1	0.02	0.002
Alternative C - Central Nevada Alternative									
Sevier River	silt loam with sand lenses	0	40	50	10	0	0.25	0.02	0.002
Steptoe Creek	(very fine) sandy loam	0	70	20	10	0	.1	0.02	0.002
	clay loam	0	30	40	30	0	.42	0.02	0.002
Alternative D - Sevier-Escalante Desert Alternative									
Sevier River	silt loam with sand lenses	0	40	50	10	0	0.25	0.02	0.002
Beaver River	sandy loam	20	56	16	8	51	0.42	0.02	0.002

Sources: U.S. Department of Agriculture Soil Conservation Service. 1960. Soil Survey of the Beryl - Enterprise area, Utah. Washington D.C.
_____ 1967. Soil Survey of Las Vegas and Eldorado Valley area, Nevada. Washington D.C.
_____ 1972. Soil Survey of Utah County. Washington D.C.
_____ 1980. Soil Survey of Big Smokey Valley area, Nevada, Part of Nye County. Washington D.C.
_____ 1976. Soil Survey of Beaver - Cole Fort area, Utah. Washington D.C.
_____ 1980. Soil Survey of Morgan area, Utah Morgan County and eastern part of Weber County. Washington D.C.
_____ 1977. Soil Survey of Delta Utah area, Utah. Washington D.C.

Figures 1 through 3 show the grain size distribution curves. These figures show that the curves fall into two grain size groups. (Figure 4 shows these groups.) A best fit curve was drawn and a D_{50} grain size was chosen, which are indicated by the arrows in figure 4.

The larger D_{50} grain size (2.6 mm) is typical of Beaver River, Muddy River, Woodruff Creek, Provo River, Weber River, and Chalk Creek. The smaller D_{50} grain size (0.25 mm) is typical of Sevier River, Steptoe Creek, Las Vegas Wash, and Salt Creek. These grain sizes are used to determine the rate of fall, based upon the curve shown in figure 5.

The major concern at a stream crossing would be the distance that sediment would move downstream and the effect it would have on the aquatic system. (For effects on the aquatic biological environment see the Terrestrial and Aquatic Biology Technical Report.) To estimate the sediment transport distance three types of data are used: 1) average conditions of stream flow, 2) grain sizes (figure 4 and table 1) and 3) settling velocities (figure 5). These numbers are used to determine at what point downstream the various sediment sizes would fall out under average flow conditions (assuming laminar flow). The following procedure is used:

1. Determine fall velocities from figure 5. Then convert fall velocities from cm/sec to ft/sec using the following conversion: cm divided by 30.48.

2. Determine average velocity and average flow depth from table 1. In this report 1.7 ft/sec is used for average velocity and 1.2 ft. is used for average depth.

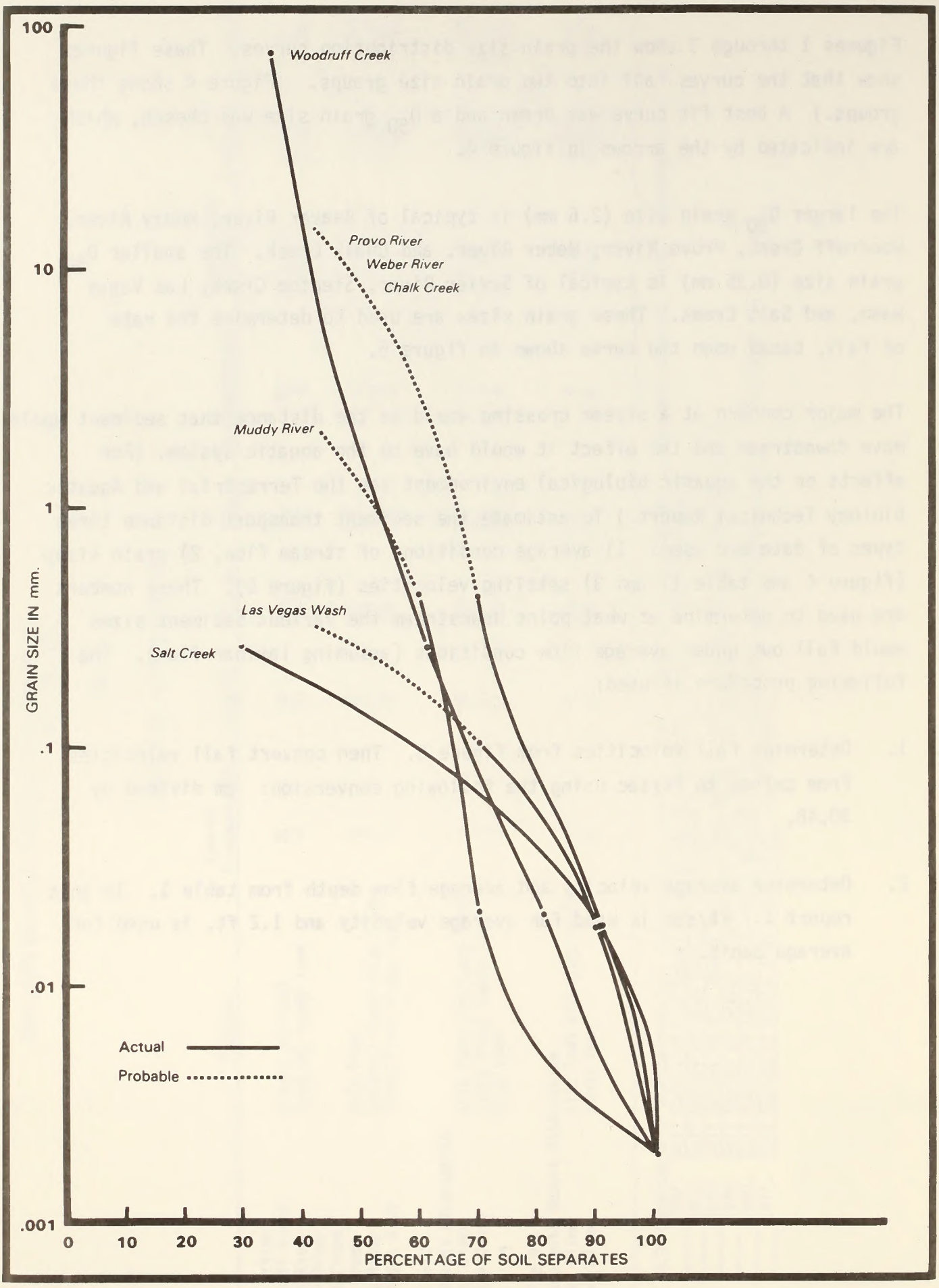

FIGURE 1 GRAIN SIZE DISTRIBUTION CURVES -(proposed action)

FIGURE 2 GRAIN SIZE DISTRIBUTION CURVES -(sevier-escalante desert alternative)

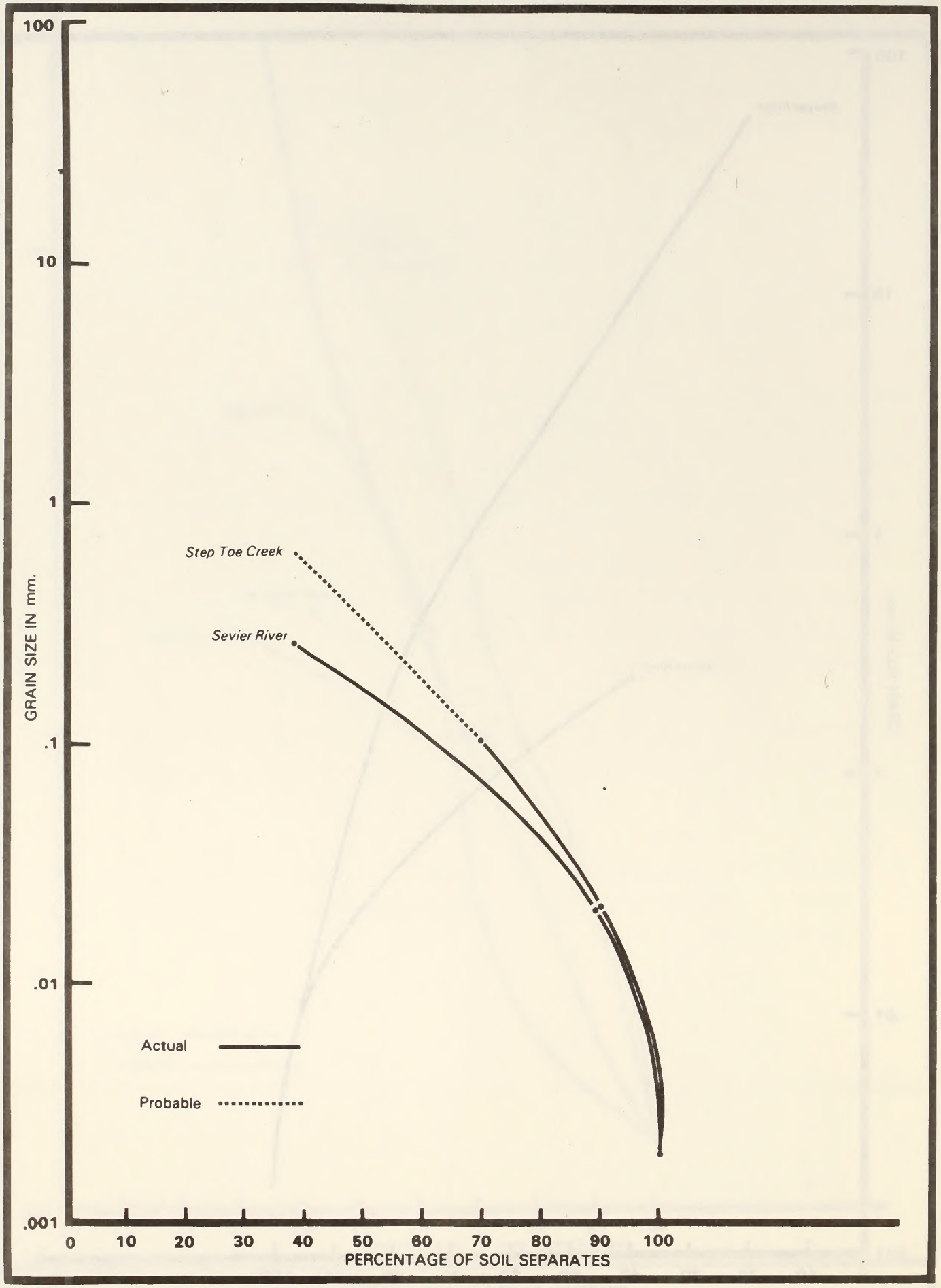

FIGURE 3 GRAIN SIZE DISTRIBUTION CURVES -(central nevada alternative)

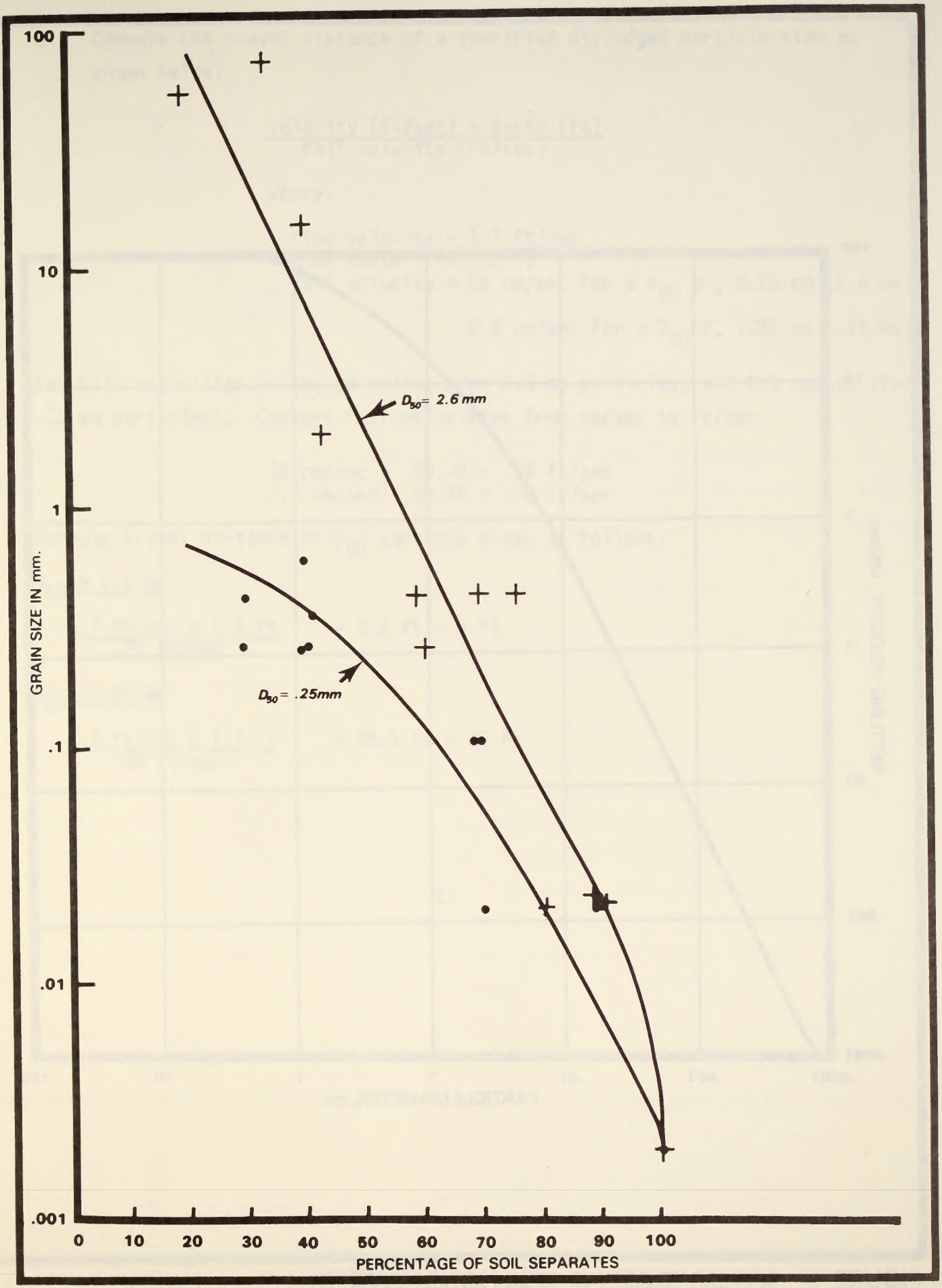

FIGURE 4 BEST FIT CURVES FOR THE GRAIN SIZE GROUPS

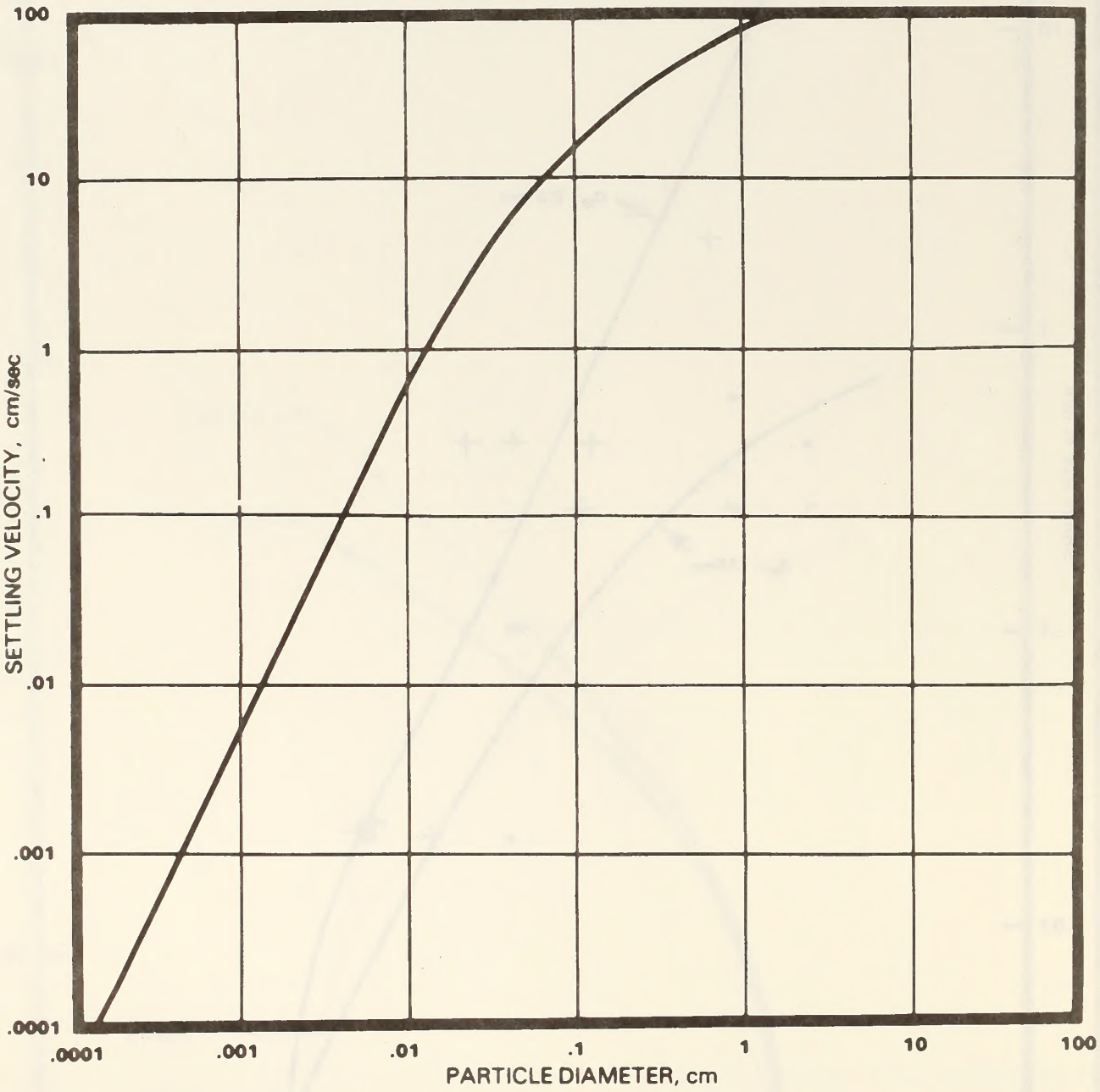

FIGURE 5 SETTLING VELOCITY VS. MEAN PARTICLE DIAMETER

3. Compute the travel distance of a specified dislodged particle size as shown below:

$$\frac{\text{velocity (ft/sec)} \times \text{depth (ft)}}{\text{fall velocity (ft/sec)}}$$

Where:

flow velocity = 1.7 ft/sec
flow depth = 1.2 ft
fall velocity = 12 cm/sec for a D_{50} of, 0.26 cm (2.6 mm)
2.3 cm/sec for a D_{50} of, .025 cm (.25 mm)

Two fall velocities exist, 12 cm/sec (for 2.6 mm particles) and 2.3 cm/sec (for .25 mm particles). Convert fall velocities from cm/sec to ft/sec.

12 cm/sec - 30.48 = .39 ft/sec
2.3 cm/sec - 30.48 = .08 ft/sec

Compute travel distance of D_{50} particle sizes as follows:

D_{50} = 2.6 mm

$$\frac{1.7 \text{ ft/sec} \times 1.2 \text{ ft}}{.39 \text{ ft/sec}} = 5.2 \text{ ft} = 5 \text{ ft}$$

D_{50} = .25 mm

$$\frac{1.7 \text{ ft/sec} \times 1.2 \text{ ft}}{.08 \text{ ft/sec}} = 25.5 \text{ ft} = 25 \text{ ft}$$

Based upon the D_{50} particle size the above figures show how long it would take for 50% of the construction induced sediment load to drop out. The silt particles (.02 mm) have a fall velocity of 0.03 cm/sec and the clay particles (.002 mm) have a fall velocity of .0003 cm/sec. Converting fall velocities to ft/sec and computing as above, transport distances for specific size particles can be determined.

silt = 0.02mm

$$\frac{1.7 \text{ ft/sec} \times 1.2 \text{ ft}}{0.001 \text{ ft/sec}} = 2{,}040 \text{ ft} = 2{,}000 \text{ ft}$$

clay = 0.002mm

$$\frac{1.7 \text{ ft/sec} \times 1.2 \text{ ft}}{0.00001 \text{ ft/sec}} = 204{,}000 \text{ ft} = 200{,}000 \text{ ft}$$

Based upon the best fit curves shown in figure 2, the soil particles disturbed during construction would travel one of two distances based upon varying grain sizes.

In the first case, those streams which have a cobbly or gravelly bottom and banks, would deposit their sediments as shown below:

Sediment	Percent lost	Distance in feet
Sand and Gravel	50%	5
Silt	90%	2,000
Clay	100%	200,000

In the second case, those streams which do not have a cobbly bottom or have a sandy type bottom, would deposit their sediments as shown below:

Sediment	Percent lost	Distance in feet
Sand and Gravel	50 %	25
Silt	80 %	2,000
Clay	100 %	200,000

It should be noted that this is only an estimate of the transport distance. Turbulence has not been figured into these calculations and it is assumed that there would be minimal aggregation of the soil particles. Some of the finest sediment may remain in suspension indefinitely. To make an accurate assessment of the sediment transport characteristics for each stream would require extensive field monitoring during construction. Similarly, to determine the quantity of sediment that would be induced to transport due to construction would require field monitoring during construction or at the next peak flow. Several suspended sediment models were considered for use in this technical report, however they were all considered to be unreliable to accurately determine the amount of sediment that would be produced by construction.

Floodplains

Each permanent aboveground facility associated with the Proposed Action, alternatives, and variations was located on 1:250,000 scale maps to determine if it would be located in a 100-year floodplain. Every stream would have a floodplain associated with it; however, many have not had sufficient hydrological studies to determine the extent of the 100-year floodplain. Therefore, facilities located within one contour interval of a stream and having a likely map location were presumed to be in a 100-year floodplain.

Hydrostatic Test Water

At construction completion, the pipeline will be hydrostatically tested as required in 49 CFR 192. Water for the test will be obtained from locally approved sources such as water wells, canals, or streams or transferred from section to section. After the test, the pipeline will be squeegeed. The quality of the test water will be monitored prior to filling the line, during discharge, and after discharge. The discharge of the test water will either be into a dry waterway or into temporary evaporation ponds. If the discharge is into a dry waterway, such as an intermittent stream, the discharge rate will not be greater than the reported flow exprienced during normal flow periods.

AFFECTED ENVIRONMENT

Surface Water

The Proposed Action, alternatives, and variations would cross a variety of types of streams in many topographic positions. (Table 3 lists the stream crossings by the Proposed Action, alternatives, and variations.)

Ground Water

The Proposed Action, alternatives, and variations would traverse five water resources regions: 1) upper and lower Colorado, 2) Great Basin, 3) Pacific, 4) Northwest, and 5) California (Davidson 1979, Eakin 1976, Foxworthy 1979, Price and Arnow 1974, and Thomas and Phoenix 1976). In all these water resource regions, ground water would occur in two modes:

Consolidated rock reservoirs:

Ground water occurring in consolidated rock reservoirs generally would lie far below the excavation depth for the pipeline. There may be local instances where ground water may be isolated in consolidated rock reservoirs above deeper reservoirs. In these cases, seeps and springs would occur where bedrock comes into contact with alluvium.

Alluvial deposits:

Ground water contained in alluvial deposits may be near or at the land surface in low parts of valleys that contain lakes or streams, or in valleys that have no external drainage.

Floodplains

Each stream crossing would have a floodplain associated with it and construction would trench through them. The floodplain would vary in width from a few feet to a couple of miles. Because the pipeline would be buried and no aboveground permanent structures would be constructed in any 100-year floodplain, floodstage would not be affected.

Hydrostatic Test Water

The pipeline will be hydrostatically tested in sections which vary in length, primarily dependent on topographic constraints. The water used for testing will be utilized in as many successive segments as is practicable. The test water will be discharged in an environmentally acceptable manner in accordance with applicable regulations.

TABLE 3

SUMMARY OF STREAM CROSSING DATA

	Total Stream Crossings	FLOW CLASS Intermittant	Perennial	U.S. Fish & Wildlife Stream Classification System Class I	II	III	IV	UC
Proposed Action	61	32	29	3	9	5	2	42
Alternative A - Northern Systems Alternative		18	18					
Worst Case	36	18	18	-	-	5	1	30
Best Case	10	3	7	-	-	4	-	6
Alternative B - Sanpete Valley Alternative	85	41	44	3	8	11	4	59
Alternative C - Central Nevada Alternative	88	44	44	2	11	5	4	66
Alternative D - Sevier-Escalante Desert Alternative	64	29	35	3	9	5	4	43
Alternative E - West Salt Lake Alternative	41	20	25	1	1	4	5	34
Alternative F - Provo Canyon Alternative	53	28	25	3	2	5	1	42

*The FWS does not have a stream classification system for California. Further research has shown that the California Department of Fish & Game also lacks a stream classification system. Therefore, streams in California were not classified for fisheries (Delisle 1980).

FWS Classes:

I=Highest
II=High priority
III=Substantial
IV=Limited
UC=Unsurveyed or no fishery resource

TABLE 3 (Cont'd)

SUMMARY OF STREAM CROSSING DATA

	Total Stream Crossings	FLOW CLASS Intermittant	Perennial	U.S. Fish & Wildlife Stream Classification System Class I	II	III	IV	UC
Variation 1 - Strawberry Reservoir Variation	5	1	4	1	3	1	-	-
Variation 2 - Thistle Creek Variation	7	5	2	-	-	2	1	4
Variation 3 - East Las Vegas Variation	2	2	0	-	-	-	-	2
Variation 4 - Fort Mojave Variation	1	1	0	-	-	-	-	1
Variation 5 - Mill Creek Variation	1	1	0	-	1	-	-	-
Variation 6 - Daniels Canyon Variation	7	2	5	1	3	1	-	3

*The FWS does not have a stream classification system for California. Further research has shown that the California Department of Fish & Game also lacks a stream classification system. Therefore, streams in California were not classified for fisheries (Delisle 1980).

FWS Classes:

I=Highest
II=High priority
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ENVIRONMENTAL CONSEQUENCES

Surface Water

Pipeline construction at stream crossings would disturb both the stream bottom and the banks. It would also increase sediment movement to temporary, higher levels which have not been determined. However, the disturbance of the streams cross section and the increase in sediment would be short term (3 to 5 days). This would be similar to a major storm event. Since water velocities and discharge would not be increased, such as in a storm event, the distances that sediment would be transported would be shorter during construction. The sand and gravel materials would settle out within a very short distance; they are inert soil materials and would have no effect on the water. The silt and clay particles are more chemically active having to more surface area and would be transported further, 2,000 feet and 200,000 feet respectively. However, these particles represent such a small percentage of the construction-induced load that no significant impacts would occur.

Construction would cause some chemical changes in the water. Sediment mixing with water and fuels or lubricants entering the water may dissolve slightly. It is expected that levels of contaminants, such as lubricants and fuel introduced by construction into the waters that are crossed, will exceed state standards for short distances (100 to 200 feet.) downstream. However, these distances will be so short and mixing so rapid that violations of water quality will not be measurable. This is, therefore, considered an insignificant impact.

Ground Water

For most of its length, the pipeline excavation would not encounter ground water. At some stream, road, and utility crossings and in some other topographically low areas, ground water may be encountered. Dewatering may be necessary at some of these sites to maintain slope stability. Effects on ground water would be localized and temporary and thus insignificant.

Floodplains

Executive Order 11988 requires that Federal agencies make every effort to avoid locating aboveground structures in 100-year floodplains. This is to avoid damage to property and ecological harm to the floodplain. The proposed pipeline system would cross a floodplain at every stream crossing. No aboveground permanent facilities would be constructed within a 100-year floodplain, therefore there would be no property damage from such a flood. The pipeline would be buried in the 100-year floodplain at each stream crossing; however, since existing regulations require that the pipeline be buried below the maximum scour depth, there would be no effects on flood stage.

Hydrostatic Test Water

Due to withdrawal and discharge of hydrostatic test water being in compliance with applicable local, state, and Federal laws, the impacts would be within the range allowed by these laws; therefore, the impacts would be insignificant.

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APPENDIX A

WATER RESOURCES

STREAM CROSSING TABLES

TABLE A-1

STREAM CROSSINGS: PROPOSED ACTION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Rich	Utah					
		Rabbit Creek	1	I	UC	Sacramento
		Six Mile Creek	4	I	UC	
		Duck Creek	7	I	UC	
		Sage Creek	9	I	UC	
		Otter Creek	15	P	III	
		Little Creek	18	P	UC	
		Big Creek	20	P	UC	
		Woodruff Creek	28	P	II	
		Saleratus Creek	33	P	UC	
		Crane Creek	45	P	UC	
		Shearing Coral Creek	47	P	UC	
		Suttons Creek	48	I	UC	
Summit	Utah					
		Echo Creek	51	I	UC	Sacramento
		Chalk Creek	68	P	II	
		Mill Fork	69	P	UC	
		South Fork Creek	79	I	UC	
		Pine Creek	96	I	UC	
		Fort Creek	99	I	UC	
		Weber River	100	P	IV	
		Beaver Creek	102	P	I	

I=Intermittent
P=Perennial

TABLE A-1 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Provo River	108	P	III	Sacramento
		Lake Creek	121	I	UC	
		Strawberry River	123	P	I	
		Strawberry River	132	P	II	
		Clyde Creek	134	P	II	
		Mud Creek	136	P	II	
		Strawberry Tunnel	140	P	UC	
		Horse Creek	141	P	II	
		Fourth Water Creek	143	I	UC	
		Streeper Creek	143	I	II	
		Indian Creek	144	P	II	
		First Water Creek	147	P	IV	
Utah	Utah					
		Soldier Creek	157	P	III	Sacramento
		Dairy Fork	159	P	UC	
		Lake Fork	165	P	III	
		Little Clear Creek	167	I	UC	
Juab	Utah					
		Salt Creek	188	P	II	Sacramento
		Chriss Creek	217	I	UC	
		Sevier River	219	P	IV	
Millard	Utah					
		Pioneer Creek	246	I	UC	Sacramento
		Chalk Creek	251	P	UC	
		Chalk Creek	258	P	UC	
		Cove Creek	286	I	UC	

I=Intermittent
P=Perennial

TABLE A-1 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Beaver	Utah					
		Low Line Canal	306	P	UC	Sacramento
		Beaver River	309	P	UC	
Iron	Utah					
		Dick Palmer Wash	348	I	UC	Sacramento
Washington	Utah					
		Spring Creek	375	P	UC	Sacramento
		Magotsu Creek	385	P	UC	Los Angeles
		Moody Wash	390	P	UC	
		Cove Wash	391	I	UC	
		Tobin Wash	394	I	UC	
		Manganese Wash	398	I	UC	
		Beaver Wash	415	I	UC	
Lincoln	Nevada					
		Toquop Wash	432	I	UC	Los Angeles
Clark	Nevada					
		Weiser Wash	456	I	UC	Los Angeles
		Muddy River	459	P	I	
		California Wash	483	I	UC	
		Gypsum Wash	491	I	UC	
		Las Vegas Wash	506	I	UC	
		Piute Wash	561	I	UC	
San Bernardino	California					
		Piute Wash	593	I	UC	Los Angeles

I=Intermittent
P=Perennial

TABLE A-2

STREAM CROSSINGS: ALTERNATIVE A, NORTHERN SYSTEMS ALTERNATIVE

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
		(Kemmerer Loop)				
Lincoln	Wyoming	Rock Creek	2	P	IV	Sacramento
		Bear Creek	13	P	III	
		(Pegram Loop)				
Bear Lake	Idaho	Bear River	0	P	III	Walla Walla
		Telluride Canal	8	P	UC	
		(Soda Springs Loop)				
Caribou	Idaho	Bear River	10	P	III	Walla Walla
		Bear River	13	P	III	
		Soda Canal	19	P	UC	
		Soda Canal	29	P	UC	
		(Pocatello Loop)				
Power Company	Idaho	Blind Spring Creek	2	I	UC	Walla Walla
		Sunbeam Creek	3	I	UC	
		Rock Creek	8	P	III	
		Fall Creek	13	I	UC	
		(Brentwood-Panoche Junction)				
Contra Costa	California	Kellog Creek	2	I	UC	Sacramento
		Brushy Creek	7	P	UC	
		Old River	10	P	UC	

I=Intermittent
P=Perennial

TABLE A-2 (cont'd)

County and State	Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
San Joaquin California					
	California Aqueduct	18	P	UC	Sacramento
	Corral Hollow Creek	23	I	UC	
	Hetch Hetchy Aqueduct	27	P	UC	
	Lone Tree Creek	29	I	UC	
	Hospital Creek	31	I	UC	
Stanislaus California					
	Ingram Creek	38	P	UC	Sacramento
	Del Puerto Creek	42	I	UC	
	Salado Creek	47	I	UC	
	Crow Creek	51	P	UC	Los Angeles
	Orestimba Creek	55	I	UC	
	Garzas Creek	59	I	UC	
Merced California					
	Quinto Creek	66	I	UC	Los Angeles
	California Aqueduct	67	P	UC	
	Romero Creek	68	I	UC	
	San Luis Canal	71	P	UC	
	Salt Creek	82	I	UC	
	Ortigalita Creek	84	I	UC	
	Laguna Seca Creek	90	I	UC	

I=Intermittent
P=Perennial

TABLE A-2 (cont'd)

County and State	Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Fresno California					
	Panoche Creek	111	I	UC	Los Angeles
San Bernardino California	(Southern California Gas PG&E Connection)				
	Mojave River	5	I	UC	Los Angeles
	Mojave River	26	P	UC	

I=Intermittent
P=Perennial

The worst case would include all stream crossings in table A-8.

The Best Case would only include those 10 stream crossings from table A-8 that are located in Idaho.

TABLE A-3

STREAM CROSSINGS: ALTERNATIVE B, SANPETE VALLEY ALTERNATIVE

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Rich	Utah					
		Rabbit Creek	1	I	UC	Sacramento
		Six Mile Creek	4	I	UC	
		Duck Creek	7	I	UC	
		Sage Creek	9	I	UC	
		Otter Creek	15	P	III	
		Little Creek	18	P	UC	
		Big Creek	20	P	UC	
		Woodruff Creek	28	P	II	
		Saleratus Creek	33	P	UC	
		Crane Creek	45	P	UC	
		Shearing Coral Creek	47	P	UC	
		Suttons Creek	48	I	UC	
Summit	Utah					
		Echo Creek	51	I	UC	Sacramento
		Chalk Creek	68	P	II	
		Mill Fork	69	P	UC	
		South Fork Creek	79	I	UC	
		Pine Creek	96	I	UC	
		Fort Creek	99	I	UC	
		Weber River	100	P	III	
		Beaver Creek	102	P	I	

I=Intermittent
P=Perennial

TABLE A-3 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Provo River	108	P	III	Sacramento
		Lake Creek	121	I	UC	
		Strawberry River	123	P	I	
		Strawberry River	132	P	II	
		Clyde Creek	134	P	II	
		Mud Creek	136	P	II	
		Strawberry Tunnel	140	P	UC	
		Horse Creek	141	P	II	
		Fourth Water Creek	143	I	UC	
		Streeper Creek	143	I	II	
		Indian Creek	144	P	II	
		First Water Creek	147	P	IV	
Utah	Utah					
		Soldier Creek	157	P	III	Sacramento
		Dairy Fork	159	P	UC	
		Lake Fork	165	P	III	
		Little Clear Creek	167	I	UC	
Sanpete	Utah					
		Mudspring Wash	6	I	UC	Sacramento
		Cottonwood Creek	9	I	UC	
		Pleasant Creek	15	I	IV	
		Cedar Creek	17	I	UC	
		Oak Creek	21	I	UC	
		Six Mile Creek	42	I	III	
		Highland Canal	43	P	UC	
		San Pitch River	45	P	UC	
		Willow Creek	55	I	UC	

I=Intermittent
P=Perennial

TABLE A-3 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Sevier	Utah					
		Saline Creek	62	P	UC	Sacramento
		Sevier River	63	P	UC	
		Piute Canal	70	P	UC	
		Sevier River	76	P	UC	
		Sevier Canal	78	P	UC	
		Sevier River	90	P	UC	
		Monroe Canal	91	P	UC	
		South Bend Canal	92	P	UC	
Piute	Utah					
		Deer Creek	102	P	III	Sacramento
		Beaver Creek	104	P	III	
		Cottonwood Creek	109	P	IV	
		Ten Mile Creek	114	P	III	
		City Creek	121	P	III	
		Sevier River	123	P	IV	
		Cottonwood Creek	125	P	II	
		Birch Creek	128	I	UC	
Garfield	Utah					
		Pine Creek	129	I	UC	Sacramento
		Chokeberry Creek	130	I	UC	
Iron	Utah					
		Fremont Wash	140	I	UC	Sacramento
		Parowan Creek	166	I	UC	
		Summit Creek	170	I	UC	
		Braffits Creek	173	I	UC	
		Johnson Creek	175	I	UC	
		Iron Springs Creek	188	I	UC	
		Dick Palmer Wash	191	I	UC	

I=Intermittent
P=Perennial

TABLE A-3 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Washington	Utah					
		Spring Creek	375	P	UC	Sacramento
		Magotsu Creek	385	P	UC	Los Angeles
		Moody Wash	390	P	UC	
		Cove Wash	391	I	UC	
		Tobin Wash	394	I	UC	
		Manganese Wash	398	I	UC	
		Beaver Wash	415	I	UC	
Lincoln	Nevada					
		Toquop Wash	432	I	UC	Los Angeles
Clark	Nevada					
		Weiser Wash	456	I	UC	Los Angeles
		Muddy River	459	P	I	
		California Wash	483	I	UC	
		Gypsum Wash	491	I	UC	
		Las Vegas Wash	506	I	UC	
		Piute Wash	561	I	UC	
San Bernardino	California					
		Piute Wash	593	I	UC	Los Angeles

I=Intermittent
P=Perennial

TABLE A-4

STREAM CROSSINGS: ALTERNATIVE C, CENTRAL NEVADA ALTERNATIVE

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Rich	Utah					
		Rabbit Creek	1	I	UC	Sacramento
		Six Mile Creek	4	I	UC	
		Duck Creek	7	I	UC	
		Sage Creek	9	I	UC	
		Otter Creek	15	P	III	
		Little Creek	18	P	UC	
		Big Creek	20	P	UC	
		Woodruff Creek	28	P	II	
		Saleratus Creek	33	P	UC	
		Crane Creek	45	P	UC	
		Shearing Coral Creek	47	P	UC	
		Suttons Creek	48	I	UC	
Summit	Utah					
		Echo Creek	51	I	UC	Sacramento
		Chalk Creek	68	P	II	
		Mill Fork	69	P	UC	
		South Fork Creek	79	I	UC	
		Pine Creek	96	I	UC	
		Fort Creek	99	I	UC	
		Weber River	100	P	III	
		Beaver Creek	102	P	I	

I=Intermittent
P=Perennial

TABLE A-4 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Provo River	108	P	III	Sacramento
		Lake Creek	121	I	UC	
		Strawberry River	123	P	I	
		Strawberry River	132	P	II	
		Clyde Creek	134	P	II	
		Mud Creek	136	P	II	
		Strawberry Tunnel	140	P	UC	
		Horse Creek	141	P	II	
		Fourth Water Creek	143	I	UC	
		Streeper Creek	143	I	II	
		Indian Creek	144	P	II	
		First Water Creek	147	P	IV	
Utah	Utah					
		Soldier Creek	157	P	IV	Sacramento
		Dairy Fork	159	P	UC	
		Lake Fork	165	P	UC	
		Little Clear Creek	167	I	IV	
Juab	Utah					
		West Creek	3	I	IV	Sacramento
		Furner Creek	18	I	UC	
		Dog Valley Wash	19	I	UC	
		Sevier River	22	P	IV	
Millard	Utah					
		Sevier River	30	P	IV	
		Central Utah Canal	31	P	UC	
		Sevier River	45	P	UC	
		Sevier River	48	P	UC	
		Soap Wash	74	I	UC	
		Baker Creek	133	I	UC	

I=Intermittent
P=Perennial

TABLE A-4 (Cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
White Pine	Nevada					
		Mill Creek	144	I	UC	Sacramento
		Strawberry Creek	147	I	UC	
		Weaver Creek	149	I	UC	
		Cooper Wash	183	I	UC	
		Steptoe Creek	190	P	UC	
		Underground Aqueduct	200	P	UC	
		Jakes Wash	213	I	UC	
		Ellison Creek	221	P	UC	
		White River	223	P	II	
Nye	Nevada					
		Currant Creek	235	I	II	
		Currant Creek	243	I	II	
		Hot Creek	295	P	UC	
		Willow Creek	321	I	UC	
		Saulsbury Wash	333	I	UC	
Esmeralda	Nevada					
		Slime Wash	367	I	UC	Sacramento
		Columbus Salt Marsh	400 to 412	I	UC	
Mono	California					
		Morris Creek	431	I	UC	Los Angeles
		Montgomery Creek	435	I	UC	
		Marble Creek	439	P	UC	
		Rock Creek	442	I	UC	
		Pellisier Creek	444	I	UC	
		Birch Creek	445	I	UC	
		Willow Creek	446	I	UC	
		Lone Tree Creek	447	I	UC	
		Miller Creek	451	I	UC	
		Piute Creek	455	I	UC	

I=Intermittent
P=Perennial

TABLE A-4 (cont'd)

County and State	Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Inyo California					
	S. McNally Canal	467	P	UC	Los Angeles
	Collins Canal	470	I	UC	
	Owens River	482	P	UC	
	Big Pine Canal	484	P	UC	
	Birch Creek	485	P	UC	
	Owens River	488	P	UC	
	Owens River	496	I	UC	
	Owens River	518	P	UC	
	Cottonwood Creek	533	P	UC	
	Ash Creek	535	P	UC	
	Los Angeles Aqueduct	543	P	UC	
	Summit Creek	545	I	UC	
	Haiwee Creek	553	I	UC	
	Los Angeles Aqueduct	558	P	UC	
Kern California					
	Little Dixie Wash	588	I	UC	Los Angeles
San Bernardino California					
	Fremont Wash	658	I	UC	Los Angeles

I=Intermittent
P=Perennial

TABLE A-5

STREAM CROSSINGS: ALTERNATIVE D, SEVIER-ESCALANTE DESERT ALTERNATIVE

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Rich	Utah					
		Rabbit Creek	1	I	UC	Sacramento
		Six Mile Creek	4	I	UC	
		Duck Creek	7	I	UC	
		Sage Creek	9	I	UC	
		Otter Creek	15	P	III	
		Little Creek	18	P	UC	
		Big Creek	20	P	UC	
		Woodruff Creek	28	P	II	
		Saleratus Creek	33	P	UC	
		Crane Creek	45	P	UC	
		Shearing Coral Creek	47	P	UC	
		Suttons Creek	48	I	UC	
Summit	Utah					
		Echo Creek	51	I	UC	Sacramento
		Chalk Creek	68	P	II	
		Mill Fork	69	P	UC	
		South Fork Creek	79	I	UC	
		Pine Creek	96	I	UC	
		Fort Creek	99	I	UC	
		Weber River	100	P	III	
		Beaver Creek	102	P	I	

I=Intermittent
P=Perennial

TABLE A-5 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Provo River	108	P	III	Sacramento
		Lake Creek	121	I	UC	
		Strawberry River	123	P	I	
		Strawberry River	132	P	II	
		Clyde Creek	134	P	II	
		Mud Creek	136	P	II	
		Strawberry Tunnel	140	P	UC	
		Horse Creek	141	P	II	
		Fourth Water Creek	143	I	UC	
		Streeper Creek	143	I	II	
		Indian Creek	144	P	II	
		First Water Creek	147	P	IV	
Utah	Utah					
		Soldier Creek	157	P	III	Sacramento
		Dairy Fork	159	P	UC	
		Lake Fork	165	P	III	
		Little Clear Creek	167	I	UC	
Juab	Utah					
		Salt Creek	188	P	II	Sacramento
Juab	Utah					
		West Creek	3	I	IV	Sacramento
		Furner Creek	18	I	UC	
		Dog Valley Creek	19	I	UC	
		Sevier River	22	P	IV	

I=Intermittent
P=Perennial

TABLE A-5 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Millard	Utah					
		Sevier River	30	P	IV	Sacramento
		Central Utah Canal	31	P	UC	
		Sevier River	44	P	UC	
		Beaver River	78	P	UC	
		Beaver River	97	I	UC	
		Cove Creek	109	I	UC	
Beaver	Utah					
		Beaver River	122	P	UC	
		Beaver River	126	P	UC	
Washington	Utah					
		Spring Creek	375	P	UC	Sacramento
		Magotsu Creek	385	P	UC	Los Angeles
		Moody Wash	390	P	UC	
		Cove Wash	391	I	UC	
		Tobin Wash	394	I	UC	
		Manganese Wash	398	I	UC	
		Beaver Wash	415	I	UC	
Lincoln	Nevada					
		Toquop Wash	432	I	UC	Los Angeles
Clark	Nevada					
		Weiser Wash	456	I	UC	Los Angeles
		Muddy River	459	P	I	
		California Wash	483	I	UC	
		Gypsum Wash	491	I	UC	
		Las Vegas Wash	506	I	UC	
		Piute Wash	561	I	UC	
San Bernardino	California					
		Piute Wash	593	I	UC	Los Angeles

I=Intermittent
P=Perennial

TABLE A-6

STREAM CROSSINGS: ALTERNATIVE E, WEST SALT LAKE ALTERNATIVE

County and State	Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Lincoln Wyoming					
	Rock Creek	2	P	IV	Sacramento*
	Bear Creek	13	P	III	
Bear Lake Idaho					
	Ovid Creek	4	P	III	Walla Walla
	Ovid Creek	7	P	III	
Franklin Idaho					
	Mink Creek	27	I	III	Walla Walla
	Preston Riverdale Canal	28	P	UC	
	Bear River	43	P	III	
	West Cache Canal	44	P	UC	
Cache Utah					
	Weston Creek	51	P	UC	Walla Walla
	Bear River	58	P	IV	
	Clarkston Creek	63	P	IV	
Box Elder Utah					
	Malad River	72	P	IV	Walla Walla
	West Canal	83	P	UC	
	Blue Creek	95	I	UC	
	Deep Creek	125	I	UC	
	Ten Mile Creek	132	I	UC	
	Indian Creek	133	I	UC	
Tooele Utah					
	Government Creek	286	I	UC	Sacramento
	Erickson Wash	295	I	UC	

I=Intermittent
P=Perennial

* The Kemmerer loop from the Northern Systems Alternative is part of the West Salt Lake Alternative

TABLE A-6 (Cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Juab	Utah					
		Meadow Creek	297	I	UC	Sacramento
		Sevier River	332	P	IV	
		Central Utah Canal	357	P	UC	
		Chalk Creek	362	P	UC	
Beaver	Utah					
		Low Line Canal	306	P	UC	Sacramento
		Beaver River	309	P	UC	
Iron	Utah					
		Dick Palmer Wash	348	I	UC	Sacramento
Washington	Utah					
		Spring Creek	375	P	UC	Sacramento
		Magotsu Creek	385	P	UC	Los Angeles
		Moody Wash	390	P	UC	
		Cove Wash	391	I	UC	
		Tobin Wash	394	I	UC	
		Manganese Wash	398	I	UC	
		Beaver Wash	415	I	UC	
Lincoln	Nevada					
		Toquop Wash	432	I	UC	Los Angeles
Clark	Nevada					
		Weiser Wash	456	I	UC	Los Angeles
		Muddy River	459	P	I	
		California Wash	483	I	UC	
		Gypsum Wash	491	I	UC	
		Las Vegas Wash	506	I	UC	
		Piute Wash	561	I	UC	
San Bernardino	California					
		Piute Wash	593	I	UC	Los Angeles

I=Intermittent
P=Perennial

* The Kemmerer loop from the Northern Systems Alternative is part of the West Salt Lake Alternative

TABLE A-7

STREAM CROSSINGS: ALTERNATIVE F, PROVO CANYON ALTERNATIVE

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Rich	Utah					
		Rabbit Creek	1	I	UC	Sacramento
		Six Mile Creek	4	I	UC	
		Duck Creek	7	I	UC	
		Sage Creek	9	I	UC	
		Otter Creek	15	P	III	
		Little Creek	18	P	UC	
		Big Creek	20	P	UC	
		Woodruff Creek	28	P	II	
		Saleratus Creek	33	P	UC	
		Crane Creek	45	P	UC	
		Shearing Coral Creek	47	P	UC	
		Suttons Creek	48	I	UC	
Summit	Utah					
		Echo Creek	51	I	UC	Sacramento
		Chalk Creek	68	P	II	
		Mill Fork	69	P	UC	
		South Fork Creek	79	I	UC	
		Pine Creek	96	I	UC	
		Fort Creek	99	I		
		Weber River	100	P	UC	
		Beaver Creek	102	P	III	
					I	
Wasatch	Utah					
		Provo River	108	P	III	Sacramento
Wasatch	Utah					
		Provo River	8	P	III	Sacramento
		Decker Creek	18	I	I	
		Deer Creek	22	I	UC	

I=Intermittent
P=Perennial

TABLE A-7 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Utah	Utah					
		Dry Creek	43	P	UC	Sacramento
		Jordar River	47	P	III	
		Abandoned Canal	72	I	UC	
		Kimball Creek	160	I	UC	
Juab	Utah					
		Sevier River	181	P	IV	Sacramento
Millard	Utah					
		Pioneer Creek	246	I	UC	Sacramento
		Chalk Creek	251	P	UC	
		Chalk Creek	258	P	UC	
		Cove Creek	286	I	UC	
Beaver	Utah					
		Low Line Canal	306	P	UC	Sacramento
		Beaver River	309	P	UC	
Iron	Utah					
		Dick Palmer Wash	348	I	UC	Sacramento
Washington	Utah					
		Spring Creek	375	P	UC	Sacramento
		Magotsu Creek	385	P	UC	Los Angeles
		Moody Wash	390	P	UC	
		Cove Wash	391	I	UC	
		Tobin Wash	394	I	UC	
		Manganese Wash	398	I	UC	
		Beaver Wash	415	I	UC	

I=Intermittent
P=Perennial

TABLE A-7 (cont'd)

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Lincoln	Nevada					
		Toquop Wash	432	I	UC	Los Angeles
Clark	Nevada					
		Weiser Wash	456	I	UC	Los Angeles
		Muddy River	459	P	UC	
		California Wash	483	I	UC	
		Gypsum Wash	491	I	UC	
		Las Vegas Wash	506	I	UC	
		Piute Wash	561	I	UC	
San Bernardino	California					
		Piute Wash	593	I	UC	Los Angeles

I=Intermittent
P=Perennial

TABLE A-8

STREAM CROSSINGS: VARIATION 1, STRAWBERRY RESERVOIR VARIATION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Strawberry River	1	I	I	Sacramento
		Co-op Creek	3	P	II	
		Trout Creek	8	P	II	
		Strawberry River	18	P	II	
		Chipman Creek	19	P	III	

I=Intermittent
P=Perennial

TABLE A-9

STREAM CROSSINGS: VARIATION 2, THISTLE CREEK VARIATION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Utah	Utah					
		Soldier Creek	8	P	III	Sacramento
		Lake Fork	9	P	III	
		Crab Creek	10	I	UC	
		Bennie Creek	13	P	UC	
		Nebo Creek	16	P	UC	
		Dry Creek	17	I	UC	
		Thistle Creek	21	P	IV	

I=Intermittent
P=Perennial

TABLE A-10

STREAM CROSSINGS: VARIATION 3, EAST LAS VEGAS VARIATION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Clark	Nevada					
		Las Vegas Wash	19	I	UC	Los Angeles
		Duck Creek	23	I	UC	

I=Intermittent

TABLE A-11

STREAM CROSSINGS: VARIATION 4, FORT MOJAVE VARIATION

County and State	Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
San Bernadino California	Piute Wash	8	I	UC	Sacramento

I=Intermittent

TABLE A-12

STREAM CROSSINGS: VARIATION 5, MILL CREEK VARIATION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Utah	Utah	Soldier Creek	5	I	III	Los Angeles

I=Intermittent

TABLE A-13

STREAM CROSSINGS: VARIATION 6, DANIELS CANYON VARIATION

County and State		Stream Name	Milepost	Flow Class	U. S. Fish & Wildlife Service Classification	COE District
Wasatch	Utah					
		Lake Creek	8	P	III	Sacramento
		Strawberry Creek	27	P	I	
		Clyde Creek	31	I	II	
		Mud Creek	33	P	II	
		Strawberry Tunnel	35	P	UC	
		Horse Creek	37	P	II	
		Fourth Water Creek	39	I	UC	

I=Intermittent
P=Perennial

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